

App. No. 10/706,281

In the Drawings:

Corrected Drawings are attached.

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Power of Attorney

Enclosed herewith is a power of attorney authorizing the named attorneys to act on behalf of the Applicant before the Patent Office for this case.

REMARKS - General

By the above amendment, Applicants have amended the title to emphasize the novelty of the invention.

Also applicants have rewritten all claims to define the invention more particularly and distinctly so as to overcome the technical rejections and define the invention patentably over the prior art.

The purpose of the present report is a brief review of the specific characteristics of the patent application no. 10/706,281 filed on November 13, 2003 with the USPTO, entitled "Electronic Ballast for HO Fluorescent Lamps" and having as an inventor Carlos Gabriel Bianchim, in view of other patents mentioned as prior art.

The present report is based on the fact that the patent application no. 10/706,281 dated November 13, 2003, by means of the components and application processes described in the Descriptive Report thereof, does not possess the main requirements for patentability, as it does not represent a novelty in view of the state of the art described in the US Patent 5,574,335 dated November 12, 1996; US Patent 5,563,473 dated October 8, 1996; and US Patent 5,262,699 dated November 16, 1993.

In view of these considerations, the applicant argues the need of a more detailed and comparative description of the object claimed in the patent application no. 10/706,281 dated November 13, 2003, in view of the state of the art claimed in the US Patent 5,574,335 dated November 12, 1996; US Patent 5,563,473 dated October 8, 1996; and US Patent 5,262,699 dated November 16, 1993, since the claimed objects are completely distinct in their conceptions.

A) Patent application no. 10/706,281 dated November 13, 2003 comprises, in its general conception, an electronic ballast which, according to the characteristics thereof, possesses as a basic principle the formation of an electronic piece of equipment intended for the control of HO fluorescent lamps

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incorporating a proprietary structure and containing a properly customized, integrated and complete electronic circuit arranged in a caging as a protection element of the assembly in internal and external environments, being formed by a power factor rectification and control block, a half-bridge block, and an ignition pulse block, so as to make available a device for control and activation of HO fluorescent lamps capable of being operated in any environment and with the specific purpose of controlling from one to six lamps, flexible to the installation needs, depending exclusively on the sum of power of the lamps, which cannot exceed three hundred and ninety watts. Note: HO fluorescent lamps possess high ionization voltage varying from 1500 to 1600 Volts, while normal fluorescent lamps possess low ionization voltage varying from 800 to 900 Volts; therefore, electronic ballasts and, consequently, the electronic circuits thereof, require building designs which are fully different among themselves; HO lamps are almost exclusively intended for large outdoor and industrial applications.

B) US Patent 5,574,335 dated November 12, 1996 comprises, in its general conception, an electronic ballast for fluorescent lamps, i.e., a complete ballast for the control and activation of lamps in any environment, inherently arranged in a caging for internal and external installations with an input voltage ranging from 90 Volts to 250 Volts AC. This ballast is formed by a controlled power factor rectifier, a half-bridge and an ignition pulse block. The purpose of the power factor rectifier and control block is to draw the power factor close to the unit while rectifies and adjusts the power supply. An electronic circuit for the reduction of electromagnetic interference noises is at the input circuit, the half-bridge block receives the rectified and adjusted power supply from the rectification block and the control block makes the high frequency energy (square wave) available, which is then converted to alternating wave for the activation and control of the power supply, protection against absence of load, delivering an output power for a determined period of time and checking the presence of load, the ignition pulse being provided with a power supply for activation via high voltage peak to peak pulses with a protection system.

Comparison:

- US Patent 5,574,335 does not mention, at any moment, its application with six lamps and, consequently, the operation thereof;

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- Patent application no. 10/706,281 possesses a power factor correction circuit completely different from that disclosed in US Patent 5,574,335, for it utilizes a dedicated commercial integrated circuit that operates in critical conduction current mode, which provides it with a power factor close to the unit. That also creates far better conditions for the reduction of electromagnetic interference noises. The input circuit for the reduction/elimination of electromagnetic interference noises is also different, for it utilizes two EMI filters with a capacitor between them, whereas in US Patent 5,574,335 that is the result of using one EMI filter plus another inductor and two capacitors;
- Patent application no. 10/706,281 is provided with a protection system that guards the inverter power unit against overheating in the output circuit, in which the circuit controlling it is temporarily disconnected by means of a component called PTC (Positive Thermal Coefficient) thus avoiding the burning of the output circuit, a possibility that could happen in a scenario of complete absence of load, whereas US Patent 5,574,335 is not provided with this characteristic;
- The output circuit of US Patent 5,574,335 is controlled by square pulses generated by windings of a single transformer, which differs from patent application no. 10/706,281, where the output circuit possesses a dedicated commercial circuit for the lamp ignition and control;
- Patent application no. 10/706,281 possesses two capacitors coupled in parallel with the output switches (MOSFET) thereby allowing a reduction of losses in the same switches, due to the switching, thus improving the circuit performance as a whole and further increases its efficacy, whereas US Patent 5,574,335 is not provided with this characteristic; and
- Patent application no. 10/706,281 possesses a lamp activation circuit with an ignition characteristic that prevents high voltage pulse in case there is no lamp (load), that is, high voltage pulse blocking is instantaneous, whereas US Patent 5,574,335 is not provided with this characteristic.

C) US Patent 5,563,473 dated October 8, 1996 comprises, in its general conception, an electronic ballast for powering from one to six fluorescent lamps (with the possibility of including more lamps), a factory-designed feature. This patent utilizes a power factor pre-regulator followed by a half-bridge output circuit, both controlled by a dedicated commercial electronic circuit. The lamp ignition circuit is carried out by a

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L-C resonant link. The ballast is provided with an electric insulation system between input and output circuits by means of a high frequency transformer.

Comparison:

- The variation in the number of lamps for each ballast in US Patent 5,563,473 is factory-designed, i.e., the number of lamps to be installed in the ballast is defined during manufacturing, being thus impossible for the end user to change this amount according to his/her needs;
- Patent application no. 10/706,281 possesses a fully different input circuit for the reduction/elimination of electromagnetic interference noise, for it utilizes two EMI filters with a capacitor between them, whereas in US Patent 5,563,473, that is the result of using two inductors plus two grounded capacitors;
- Patent application no. 10/706,281 is provided with a protection system that guards the inverter power factor against overheating in the output circuit, in which the circuit controlling it is temporarily disconnected by means of a component called PTC (Positive Thermal Coefficient), thus avoiding the burning of the output circuit, a possibility that could happen in a scenario of complete absence of load, whereas US Patent 5,563,473 is not provided with this characteristic;
- Patent application no. 10/706,281 possesses two capacitors coupled in parallel with the output switches (MOSFET), thereby allowing a reduction of losses in the same switches, due to switching, which improves the circuit performance as a whole and further increases its efficacy, whereas US Patent 5,563,473 is not provided with this characteristic;
- Patent application no. 10/706,281 possesses a lamp activation circuit with an ignition characteristic that prevents high voltage pulse in case there is no lamp (load), that is, high voltage pulse blocking is instantaneous, whereas US Patent 5,563,473 is not provided with this characteristic, i.e., no high voltage detection or blocking system is present;
- US Patent 5,563,473 possesses a pre-heating system that operates by increasing the high voltage level on the lamp cathodes, whereas in the patent application no. 10/706,281, pre-heating is achieved by increasing the frequency above the nominal operating frequency in permanent regimen voltage for approximately 150 ms, thus allowing the cathodes to be pre-heated and later operate in normal conditions,

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without changing the cathodes life, i.e., the durability of the ballast components in general is not put into risk; and

- The electronic circuit present in the patent application no. 10/706,281 is not provided with an electric insulation system between the input and output circuits, i.e., it differs from US Patent 5,563,473 as well, because the latter possesses a transformer to perform this function.

D) US Patent 5,262,699 dated November 16, 1993 comprises, in its general conception, an electronic ballast for fluorescent lamps, more specifically for compact fluorescent lamps without power factor correction, with an EMI (Electromagnetic Interference) filter with a single inductor, and a half-bridge output circuit controlled by pulses provided by a high-frequency transformer.

Comparison:

- US Patent 5,262,699 possesses an extremely simple electronic circuit, whereas patent application no. 10/706,281 presents an electronic circuit which is far more solid and complex in its basic characteristics;
- US Patent 5,262,699 application is exclusively for compact fluorescent lamps up to 20 watts, that is, it is never mentioned its application for HO lamps with at least 80 watts;
- US Patent 5,262,699 does not mention, at any moment, its application with six lamps and, consequently, the operation thereof; it just explains the operation and control of compact fluorescent lamps;
- Patent application no. 10/706,281 possesses a power factor correction circuit completely different from that disclosed in US Patent 5,262,699, for it utilizes a dedicated commercial integrated circuit, that operates in critical conduction current mode, which provides it with a power factor close to the unit. That also creates far better conditions for the reduction of electromagnetic interference noises. The input circuit for the reduction/elimination of electromagnetic interference noises is also different, for it utilizes two EMI filters with a capacitor between them, whereas in US Patent 5,262,699, that is the result of using a single inductor;
- Patent application no. 10/706,281 is provided with a protection system that guards the inverter power factor against overheating in the output circuit, in which the circuit controlling it is temporarily disconnected by means of a component called PTC (Positive Thermal Coefficient), thus avoiding the

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burning of the output circuit, a possibility that could happen in a scenario of complete absence of load, whereas US Patent 5,262,699 is not provided with this characteristic;

- The output circuit in the US Patent 5,262,699 is controlled by square waves generated by windings of a single transformer, which differs from patent application no. 10/706,281, where the output circuit possesses a dedicated commercial circuit for the lamp ignition and control;

- Patent application no. 10/706,281 possesses two capacitors coupled in parallel with the output switches (MOSFET), thereby allowing a reduction of losses in the same switches, due to switching, which improves the circuit performance as a whole and further increases its efficacy, whereas US Patent 5,262,699 is not provided with this characteristic; and

- Patent application no. 10/706,281 possesses an electronic circuit which is capable of normal operation with an input voltage ranging from 90 Volts to 132 Volts, different from US Patent 5,262,699, in which the input voltage ranges from 108 Volts to 132 Volts, i.e., its durability is much shorter.

By means of the above comparison between patent application no. 10/706,281 and US Patent 5,574,335, US Patent 5,563,473 and US Patent 5,262,699, one is able to conclude the following:

- the electronic ballasts shown in the US Patent 5,574,335, US Patent 5,563,473 and US Patent 5,262,699 do not refer, at any moment, to the application with HO fluorescent lamps, only with common fluorescent lamps; their basic configurations do not even allow the application with HO fluorescent lamps;

- the electronic ballasts shown in the US Patent 5,574,335, US Patent 5,563,473 and US Patent 5,262,699 allow the utilization of more than one lamp in their conceptions, even though this capacity is factory-designed, that is, the end user cannot change this capacity, whereas in patent application no. 10/706,281, that is a fully versatile capacity, i.e., the user can directly define it according to his/her application needs, that is, he/she can utilize from one to six HO fluorescent lamps without any modification in the electronic ballast's structure, as it is already prepared for that; and

- the electronic ballasts shown in the US Patent 5,574,335, US Patent 5,563,473 and US Patent 5,262,699 contain electronic circuits with a fully differentiated basic design compared to patent application no. 10/706,281, particularly in their basic configurations and applications .

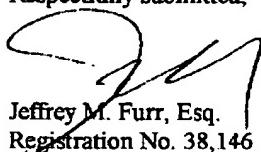
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In the light of the above and certain of having presented the required explanations so that the technical opinion issued by the Office can be reviewed, the appellant requests continued examination of the application with final granting of the patent.

Conclusion

For all of the above reasons, applicant submits that the specification and claims are now in proper form, and that the claims all define patentably over prior art. Therefore the applicant submits that this application is now in condition for allowance, which action is respectfully solicited. If the Examiner believes that the present amendments still do not resolve all of the issues regarding patentability of the pending claims, Applicant invites the Examiner to contact the undersigned attorneys to discuss any remaining issues.

Respectfully submitted,



Jeffrey M. Furr, Esq.
Registration No. 38,146

I hereby certify I have transmitted this paper by fax to the Patent and Trademark Office at 703-872-9306 on April 18, 2005.

April 18, 2005.



Jeffrey M. Furr, Esq. Reg. No. 38,146.